Rare location of a colloid cyst - case presentation

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Abstract: Not only pituitary adenomas, but also a number of tumors may arise from within the sella presenting a diagnostic and therapeutic challenge at a multidisciplinary specialist level. This article presents a case of a colloid cyst located in sellar region, with overlapping symptoms of a nonfunctioning pituitary adenoma.
Key words: colloid cyst, transsphenoidal approach

Case presentation

A 67-year-old woman presented to the endocrinology department with a 3-months history of frontal and retroocular persistent headache. Her past medical history was: type 2 diabetes mellitus treated with metformin and acarbose, hypertension and ischemic heart disease treated with simvastatin, carvedilol, trimetazidine and acetylsalicylic acid. She also has glaucoma, cataract and multinodular goiter.

On presentation his vital signs were: blood pressure 120/70 mm Hg, heart rate 88 beats/min. General examination revealed that the patient was awake, and cooperative. Endocrinological examination revealed obesity (BMI= 31.25 kg/m2), no signs of galactorrhea and a micronodular normal-sized thyroid. No focal neurological deficits and no signs of intracranial hypertension were present.

Hormonal biomarkers were in normal range:

- Cortisol 391.8 nmol / L (normal range : 7-10 a.m. - 171-536 nmol / L, 4-8 pm 64-340 nmol / L);
- FSH 31.5 mIU / ml (normal range - menopause: 25.8 - 134.8 mIU);
- Prolactin 137 uIU / ml (normal range: 72-511 uIU / ml);
- FT4 16.1 pmol / L (normal range: 12-22 pmol / L);
- TSH 1.69 mIU / mL (normal range: 0.27-4.2 mIU / mL);
- IGF-1: 79 ng / mL (normal range: 69-200 ng / mL).

The functional evaluation of the posterior pituitary gland was carried out by means of tests for diabetes insipidus.

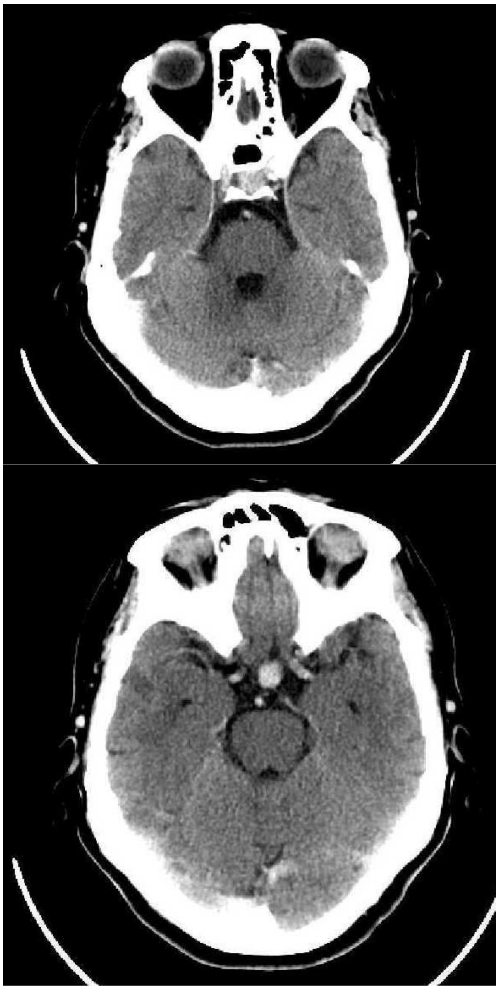


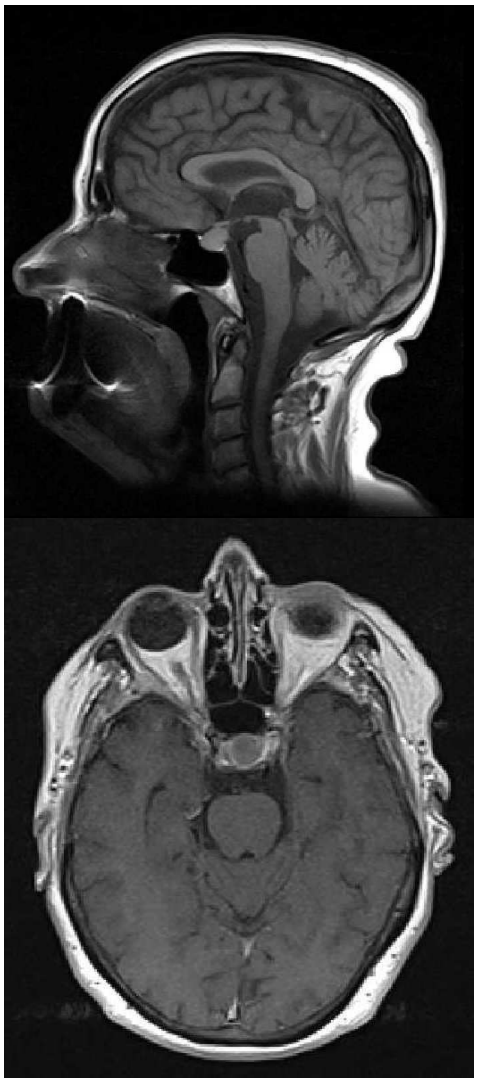
Figure 1 - CT scan: tumoral mass located in the sellar region with suprasellar extension

Cranial computer tomography scan (CT) demonstrated an 11 mm hyperdense tumoral mass, without contrast enhancement, located in the sellar region with suprasellar extension, without other pathological changes.

Chest X-ray showed pulmonary emphysema, chronic bronchitis and basal bronchiectasis.

Turkish radiography: enlarged sella.

Magnetic resonance imaging (MRI) of the brain: sellar mass measuring 1.15/1.11/1.35 cm with relatively homogeneous structure, developed mainly in the left half. Tumor extended superiorly into the suprasellar cistern and impinge on the optic chiasm and homogeneously enhancing after contrast administration.



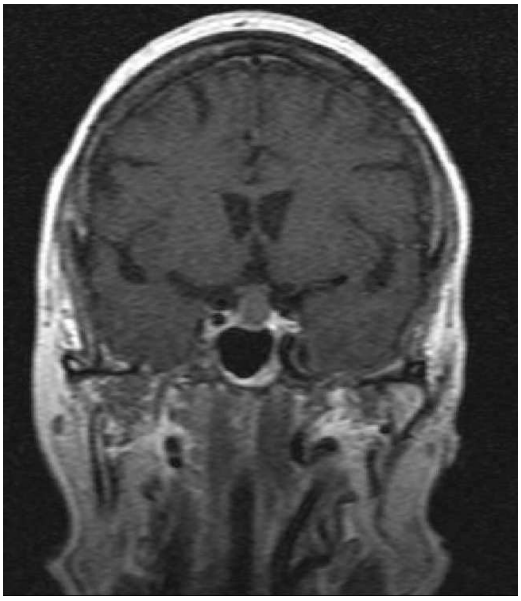
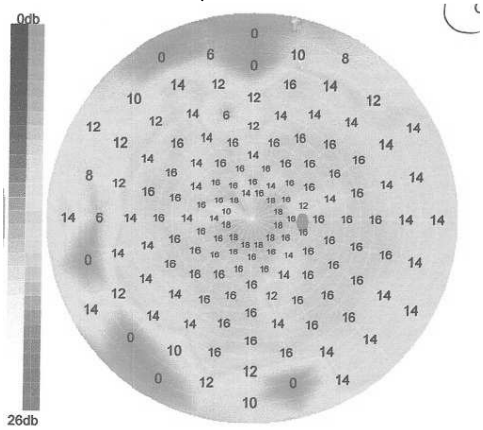


Figure 2 - Preoperative MRI. Colloid cyst of sellar region that extend up to the optic chyasma

ENT (otolaryngology) examination was within normal limits.

Cardiac exam revealed: stable angina pectoris, stage III hypertension and type 2 diabetes mellitus.

Visual field examination shows optochiasmatic syndrome:



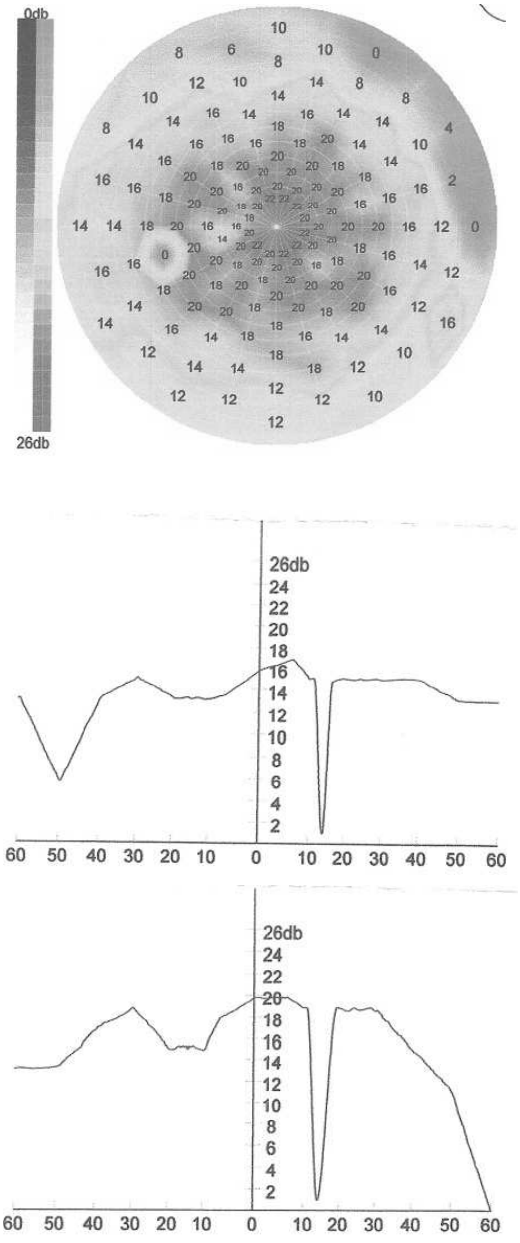


Figure 3 - Visual field examination

Given the nature of non-secreting tumor and the presence of optochiasmatic syndrome we have chosen the transsphenoidal approach.

Surgical technique

We performed endonasal surgery. After induction of general anesthesia, patient was placed in the supine position. We chose right nostril for the approach and the entire procedure was performed with an operating microscope. A handheld nasal speculum was inserted into the nostril in a trajectory along the middle turbinate, which reliably led to the sella turcica. In the posterior nasal cavity we made a vertical mucosal incision. The septum, with its mucosa intact, was then pushed off from the midline by the medial blade of the handheld speculum. Bilateral mucosal flaps were elevated over the keel of the sphenoid bone and laterally reflected. The sphenoid ostia were identified. The hand-held speculum was then replaced by a Hardy speculum. Rongeurs were used to make a large opening into the sphenoid sinus to provide adequate sellar exposure. The osseous sellar floor was widely opened and the sellar dura mater was incised. Tumor removal proceeded in a standard way using bayoneted ring curettes, irrigation, and suction. After removal of the speculum, the nasal septum was returned to the midline and the ipsilateral out-fractured middle turbinate was moved toward the midline. Nasal packing was placed for 48 hours. (Swearingen & Biller, 2008) For the next two days, patient was held under observation in order to detect diabetes insipidus and hyponatremia, and to monitor anterior pituitary function. Patient was discharged home on postoperative day 3.

Pathologic examination confirmed the diagnosis of colloid cyst.

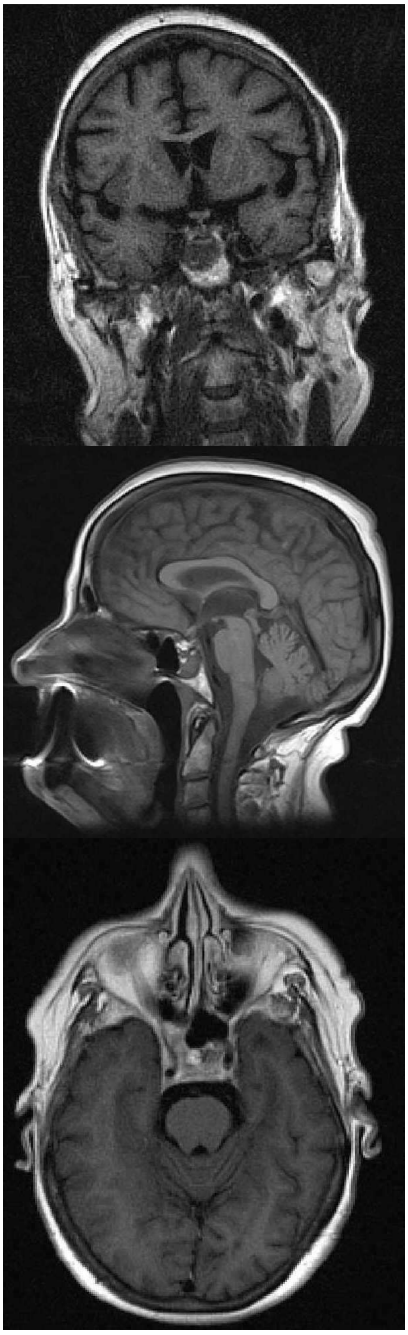


Figure 4 - Postoperative MRI images. Complete removal of sellar colloid cyst

At the 3rd month follow-up visit the patient did not show any endocrinological or focal neurological deficits. MRI brain images revealed total resection of colloid cyst and no compression on optic chiasma (Figure 4).

Discussion

Pituitary adenomas comprise more than 90% of sellar masses. The remaining 10% include pituitary-origin tumours (Rathke's cleft cysts, craniopharyngiomas, pituitary carcinomas and astrocytomas) and non-pituitary origin tumours (meningiomas, germ cell tumours, chondrosarcomas/chordomas, giant cell tumours, epidermoid cysts, aneurysms, metastatic lesions and colloid cyst). Owing to their common location, non-adenomatous sellar lesions frequently mimic pituitary macroadenomas on magnetic resonance imaging and computed tomography, resulting in a diagnostic challenge. Macroadenomas are typically isointense on T1-weighted MRI sequences, variable on T2, and show homogeneous enhancement1. They almost invariably expand the sella turcica, which can be a helpful clue to a non-adenomatous lesion when this feature is absent. While most macroadenomas can be resected via a transsphenoidal neurosurgical approach, non-adenomatous lesions may require a transcranial approach. Thus, preoperative diagnosis of a non-adenomatous pituitary tumour is difficult in directing therapy and preventing complications in case of an inadvertent trans-sphenoidal approach, such as: incomplete tumor resection, cerebrospinal fluid (CSF) leak or meningitis. But the absolute differentiation of macroadenomas from non-adenomatous pituitary tumors is not always possible prior to surgery (2).

Colloid cysts represents 0.2 - 2% of brain tumors and less than 1% of symptomatic brain tumors (3). Although these tumors are considered congenital, their diagnosis during childhood is rare. They are slow growing and the initial onset of symptoms is usually between 20 and 50 years of age, although the youngest reported patient was 2 months old and the oldest was 82 years old (4). Colloid cysts are found throughout the neuroaxis, but over 99% of them develop in the third ventricle, in most cases in the anterior roof5. Sometimes these tumors develop in sellar region, in the fourth ventricle (6, 7), velum interpositum (8, 9), intrapontomesencephalic (10), premedullary/pontine cistern (11), cerebellum (12), the region of the optic chiasma (13) or frontal lobe (14).

Colloid cysts of the pituitary gland are very rare pathological lesions occurring in sellar region. Their pathogenesis is not clear but is believed to be of endodermal origin from a vestigial ventricular structure (the paraphysis). They are located between the anterior and posterior lobe of the pituitary. Colloid cysts of the pituitary gland are space occupying lesions and could induce hypopituitarism, diabetes insipidus or visual disturbances. Magnetic resonance imaging is the preferred neurodiagnostic method in evaluating these lesions (15).

Diagnostic imaging of colloid cysts includes both MRI and CT examinations. These tumors are filled with mucus that on CT may be either hyperdense in comparison to the

grey matter (two thirds) or hypodense/ isodense (one third). There are no calcifications and there is usually enhancement of the cyst wall after contrast administration. These are mainly oval or round structures. On MRI, colloid cysts may produce diverse signal intensity. Some lesions are heterogeneous. A marked shortening of the T2 relaxation time is often noticed in the central part of the cyst (16). Approximately 50% of these pathological lesions are hyperintense in T1-weighted images. The rest may be iso- or hypointense as compared to the gray matter. In T2-weighted images, most of the colloid cysts show decreased signal intensity, while FLAIR sequences reveal increased signal intensity. In DWI sequences, those cysts are shown to form areas of decreased signal intensity. Colloid cysts of the pituitary gland reveal some typical MRI features which can be helpful in establishing the appropriate diagnosis. Due to the location of the colloid cyst in pars intermedia of the pituitary gland, in sagittal sections the lesion is placed between the anterior and the posterior lobe of the pituitary gland (17). According to laboratory studies of multiple cases, hyperprolactinaemia is found in as much as 72% of patients (3).

In our case, the colloid cyst manifested only by persistent headaches and visual disturbances (MRI and visual field examination showed optic chiasm compression). All hormonal biomarkers were in normal range before and after the surgical intervention. In the case of symptomatic sellar colloid cysts (causing endocrinological or neurological disturbances) transphenoidal resection remains the treatment of choice.

Conclusions

Apart from pituitary adenomas, a number of tumors may arise from within the sella presenting a diagnostic and therapeutic challenge at a multidisciplinary specialist level. The absolute differentiation is often not possible prior to invasive therapeutic or diagnostic procedures but subtle CT and MRI clues can indicate the possibility of a non-adenomatous lesion. This information is guiding the surgeon to the best operative approach and preventing the undue complications of an unnecessary or incomplete trans-sphenoidal resection.

Acknowledgement

This paper was co-financed from the European Social Fund, through the Sectorial Operational Programme Human Resources Development 2007-2013, project number POSDRU/159/1.5/S/138907 "Excellence in scientific interdisciplinary research, doctoral and postdoctoral, in the economic, social and medical fields - EXCELIS", coordinator The Bucharest University of Economic Studies.

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